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Systematic revision of the genus *Coelotrachelus* Schmidt, 1913  
(Scarabaeoidea: Scarabaeidae: Aphodiinae)

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**Abstract.** The species belonging to the genus *Coelotrachelus* Schmidt, 1913 are redescribed and figured. The Mexican *Coelotrachelus ixtapalapaensis*, **new species**, is described.

**Key words.** Systematics, revision, *Coelotrachelus ixtapalapaensis*, new species, Aphodiinae.

## Introduction

In preparation for a complete revision of Mexican Aphodiini, we herein revise the genus *Coelotrachelus* Schmidt, 1913. Types of critical taxa were examined. Terminology used in this work to redescribe morphological features follows that of Dellacasa et al. (2001).

## Materials

Materials studied are in the following collections:

**AMNH** – American Museum of Natural History, New York, NY, USA

**DCGC** – G. Dellacasa and M. Dellacasa collection, Genoa, Italy

**IBXM** – Instituto de Biología de Xalapa, Veracruz, Mexico

**LSAM** – Louisiana State Arthropod Museum, Baton Rouge, LA, USA

**USNM** – United States National Museum, Washington, DC, USA

## Genus *Coelotrachelus* Schmidt, 1913

*Aphodius* (*Coelotrachelus*) Schmidt, 1913: 140; Deloya and McCarty 1992: 6; Dellacasa and Gordon 1994: 153.

*Coelotrachelus*; Dellacasa et al. 2001: 122 (new status); Gordon and Skelley 2007: 479; Skelley et al. 2007: 3 (checklist).

**Type species.** *Aphodius kuntzeni* Schmidt, 1913 (subsequent designation by Dellacasa 1988: 237).

**Diagnosis.** Medium size species (length 6.0-8.0 mm), elongate, moderately convex, shiny, glabrous. Piceous or brown-reddish or black. Head arcuately narrowed anteriorly; epistome feebly gibbous, very finely punctured; clypeus feebly sinuate at middle, obtusely denticulate at sides, not bordered, lateral

margins elongately bristled; genae obtuse, ciliate, protruding more than eyes; latter small; frontal suture finely impressed, not tuberculate. Pronotum strongly transverse, flattened laterally; finely and irregularly punctured on disc, largely, irregularly and coarsely punctured on sides; latter S-shaped before hind angles, more or less narrowed toward base; hind angles obtusely dentiform; base thinly bordered or not bordered. Scutellum small, triangular. Elytra elongate, feebly widened posteriorly; striae fine, interstices nearly flat. First segment of hind tarsi shorter, as long as or distinctly longer than superior apical spur of tibiae. Fore tibiae distally tridentate and proximally not serrulate on outer margin; upper side sparsely, irregularly and finely punctured or smooth. Middle and hind tibiae with strong transverse carinae on outer face, apically fimbriate with spinules elongate and irregularly unequal. Pygidium with rather sparse, elongate and recumbent pubescence; its apical margin finely, sparsely and rather elongately ciliate. Sexual dimorphism shown in males by fore tibial spur hooked inwardly at apex and by relatively less convex pronotum. Aedeagus rather elongate, strongly sclerotized, parameres curved and acuminate apically. Epipharynx distinctly sinuate at front margin, rounded at sides; corypha protruding frontward with several stout apical spinules; epitorma conical; pedia densely and widely pubescent, with posterior rows of short chaetae; chaetopariae rather short and densely arranged.

**Distribution.** Southwestern USA and Mexico.

### Key to species of *Coelotrachelus*

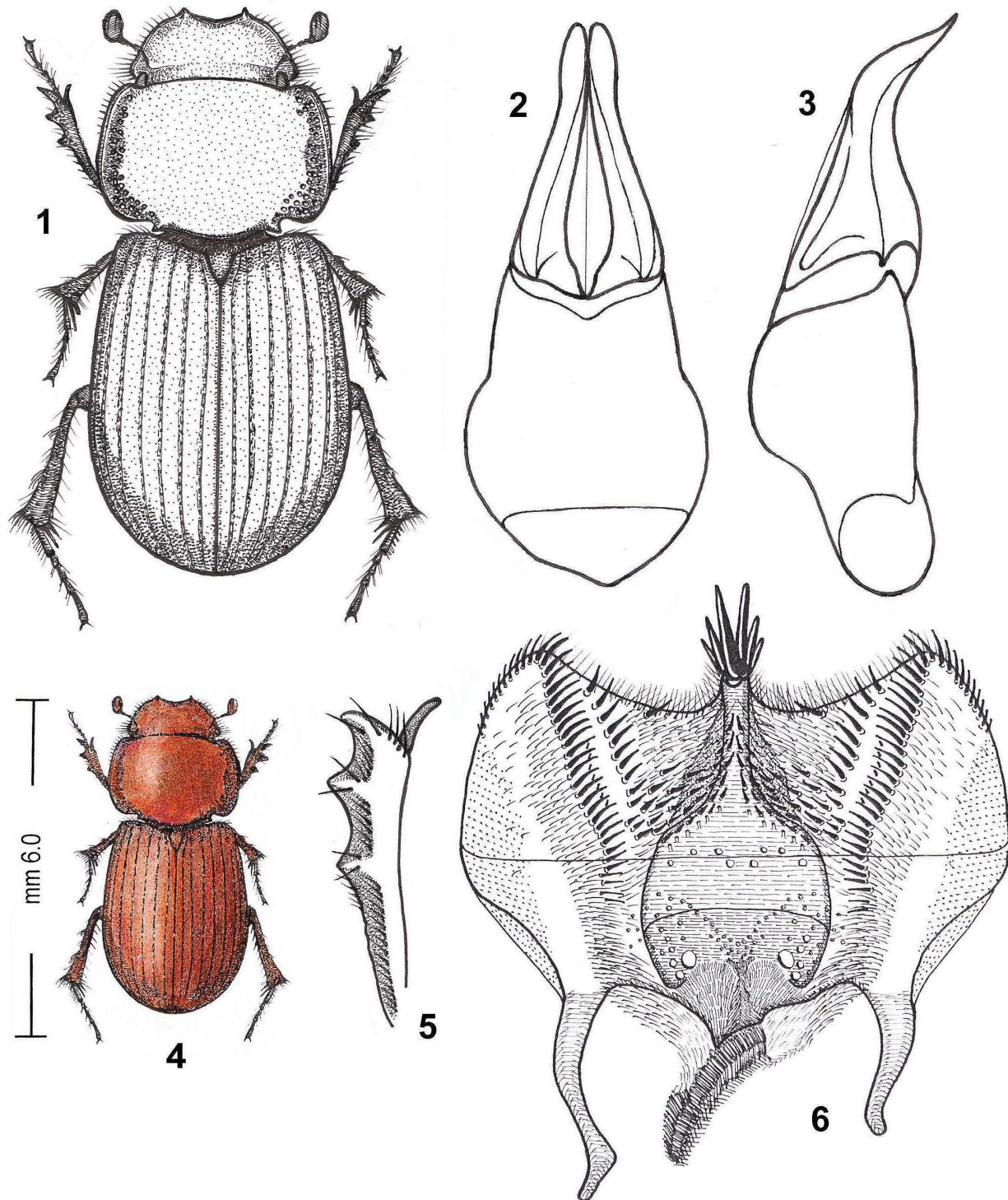
1. Elytron with shoulder denticulate ..... 2
- Elytron with shoulder not denticulate ..... 4
- 2(1). Disc of pronotum evenly finely punctured, punctures one size; sides narrowly flattened and with few large punctures. Chestnut-brown. Length 6.5-7.5 mm. Mexico (México) ..... ***C. ixtapalapaensis*, new species**
- Disc of pronotum dually punctured, small and large; large punctures irregularly scattered ..... 3
- 3(2). Lateral margins of pronotum almost straight, slightly inwardly sinuate before hind angles; large pronotal punctures relatively denser and coarser. Dark reddish to light brown. Length 6.0-7.0 mm. Mexico (Durango, Sinaloa) ..... ***C. symbius* (Gordon and Howden)**
- Lateral margins of pronotum regularly arcuate; large pronotal punctures relatively less dense and less coarse. Chestnut-brown. Length 6.0-7.5 mm. U.S.A. (Arizona, Colorado, New Mexico); Mexico (Chihuahua, Durango) ..... ***C. rudis* (LeConte)**
- 4(1). Pronotum with basal width one third of the medial width. Moderately shiny, reddish-brown. Length 8.0 mm. Mexico ..... ***C. venustus* (Schmidt)**
- Pronotum with basal width one half of the medial width ..... 5
- 5(4). Pronotum broadly transverse, moderately convex, with sides widely flattened and broadly bordered. Male fore tibiae relatively stout (Fig. 16). Shiny, black. Length 7.0-8.5 mm. Mexico (Durango, México, Veracruz) ..... ***C. kuntzeni* (Schmidt)**
- Pronotum moderately transverse, convex; sides rather narrowly flattened and narrowly bordered. Male fore tibiae relatively slender (Fig. 5). Moderately shiny, chestnut brown. Length 6.0 mm. Mexico (Morelos) ..... ***C. burgosi* (Deloya and McCarty)**

### ***Coelotrachelus burgosi* (Deloya and McCarty, 1992)**

(Fig. 1-6)

*Aphodius* (*Coelotrachelus*) *burgosi* Deloya and McCarty 1992: 2.

*Coelotrachelus burgosi*; Skelley et al. 2007: 3 (new combination).



**Figures 1-6.** *Coelotrachelus burgosi* (Deloya and McCarty, 1992), [Apancingo de Michapa, m 1300, Morelos, Mexico, holotype. 1) Habitus (morphological details). 2-3) Aedeagus (dorsal and lateral view). 4) Habitus. 5) Left fore tibia of male (dorsal view). 6) Epipharynx.



**Type locality.** Apancingo de Michapa, m 1300, Morelos, Mexico.

**Type repository.** Instituto de Biología (Xalapa, Veracruz, Mexico) (holotype male examined).

**Redescription.** Length 6.0 mm, elongate, moderately convex, strongly shiny, glabrous. Reddish, legs and antennal club somewhat darker. Head wide with epistome faintly gibbous on disc, evenly very finely punctured throughout; clypeus feebly sinuate at middle, denticulate at sides, the lateral margins elongately rather sparsely ciliate; genae obtusely angulate, ciliate, protruding more distinctly than eyes; frontal suture obsolete; front evenly almost imperceptibly punctured. Pronotum broadly transverse, flattened on sides, doubly punctured, very small punctures almost imperceptible and evenly scattered throughout, large punctures irregularly sparse on sides and somewhat denser before hind angles; sides strongly arcuate, distinctly bordered, border anteriorly shortly ciliate, S-shaped before hind angles and narrowed to fifth elytral striae level; hind angles acutely dentiform; base distinctly bisinuate, very thinly bordered. Scutellum elongate, somewhat depressed at middle toward the base, faintly punctured. Elytra oval-elongate, not denticulate at shoulder; striae fine, superficially punctured, subcrenulate; intervals flat, very sparsely and almost imperceptibly punctured. Hind tibial upper spur somewhat shorter than first tarsal segment; latter as long as following three segments combined. Male fore tibiae slender, apical spur stout, inwardly curved and downwardly bent; aedeagus Fig. 2-3. Female unknown.

**Material examined.** MEXICO, Morelos: Apancingo de Michapa, m 1300, 24.VII.1988, CCB-126 (IBXM).

**Distribution.** Known from type locality only.

**Bionomics.** The holotype was collected at light at the end of July.

***Coelotrachelus ixtapalapaensis* new species**  
(Fig. 7-11)

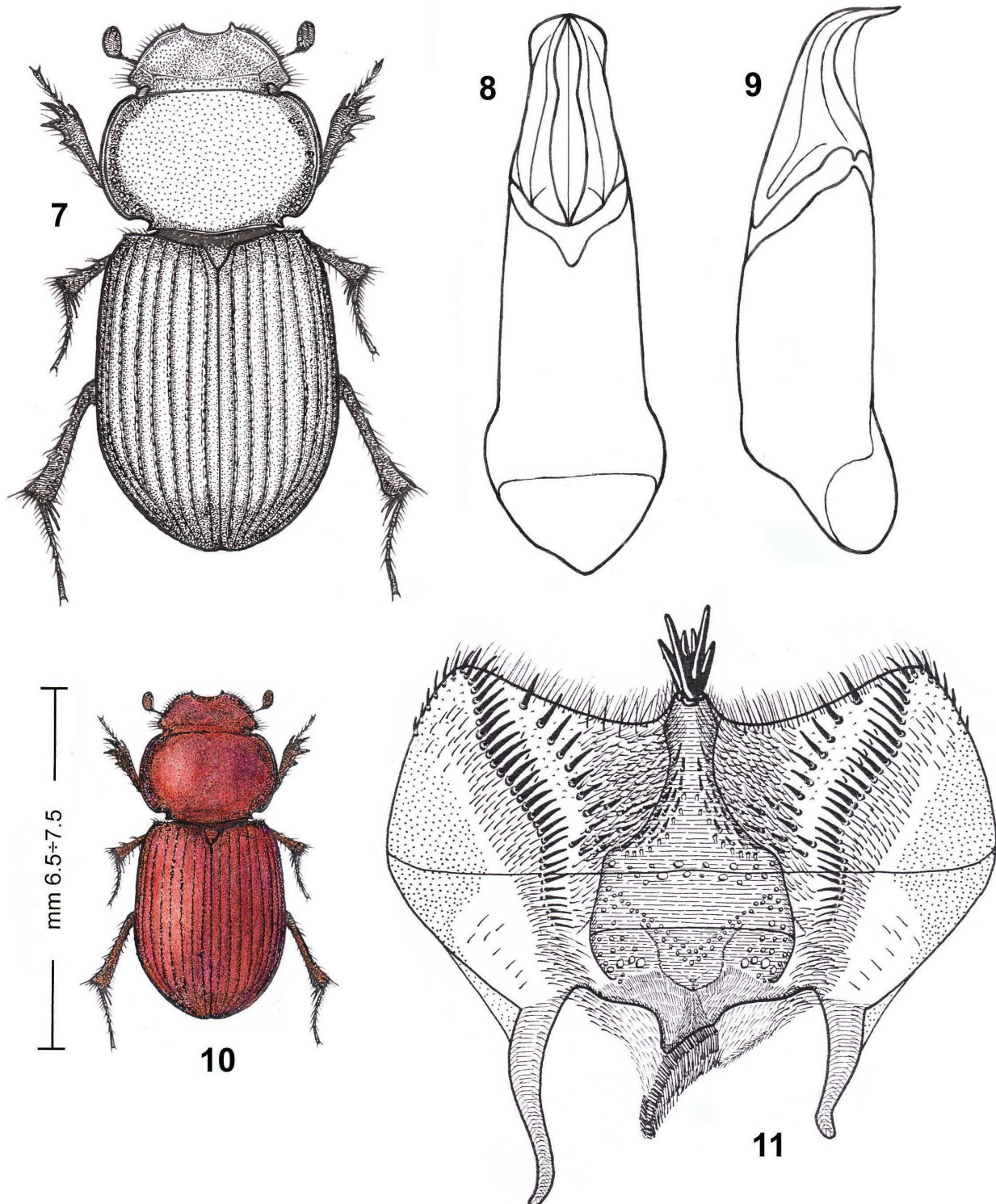
**Type locality.** Ixtapalapa, Distrito Federal, Mexico.

**Type repository.** United States National Museum (Washington, DC, USA).

**Description.** Length 6.5-7.5 mm, elongate, moderately convex, shiny, glabrous. Chestnut-brown, legs and antennal club somewhat darker. Head with epistome feebly convex on disc, extremely finely and regularly punctured throughout; clypeus slightly sinuate at middle, denticulate at sides, the very small denticles somewhat upturned, very thinly bordered, the border laterally rather elongately sparsely ciliate; genae obtuse, ciliate, protruding more strongly than eyes; frontal suture obsolete; front relatively more sparsely and superficially punctured, Pronotum broadly transverse, moderately convex, somewhat flattened at sides; doubly punctured; smaller, extremely fine and superficial punctures, subregularly scattered throughout, large punctures, five or six times larger than small, irregularly and almost sparsely arranged on sides; latter very thickly bordered, the border glabrous, S-shaped before the subdentiform hind angles; latter situated half way between the base of the fifth and sixth striae; base slightly bisinuate, not bordered. Scutellum somewhat concave, very finely punctured on basal half. Elytra oblong, moderately convex, subdenticulate at shoulder; striae fine, feebly impressed, subcrenulate; intervals nearly flat, almost imperceptibly sparsely punctured. Hind tibial upper spur as long as first tarsal segment; latter as long as following three segments combined. Male fore tibial spur relatively stout and abruptly bent downward; aedeagus Fig. 8-9. Female: fore tibial spur relatively slender and feebly bent downward.

**Type material.** MEXICO, Distrito Federal: Ixtapalapa, 12.XI.1953. leg. A. Barrera, s/ nido de *Cratogeomys m. merriami* (Th.); Holotype male and allotype female (USNM), 1 paratype male (DCGC).

**Distribution.** Known from type locality only.



**Figures 7-11.** *Coelotrachelus ixtapalapaensis* n. sp., holotype. **7)** Habitus (morphological details). **8-9)** Aedeagus (dorsal and lateral view). **10)** Habitus. **11)** Epipharynx.

**Etymology.** The species is named for the type locality.

**Bionomics.** The specimens were collected in a nest of the Mexican pocket gopher *Cratogeomys merriami merriami* (Thomas) in November.

***Coelotrachelus kuntzeni* (Schmidt, 1913)**

(Fig. 12-17)

*Aphodius* (*Coelotrachelus*) *kuntzeni* Schmidt, 1913: 175; Dellacasa and Gordon 1994: 153.

*Coelotrachelus kuntzeni*; Dellacasa et al. 2001: 123 (new combination); Skelley et al. 2007: 3.

*Aphodius amplinotum* Gordon and Howden, 1973: 436; Skelley et al. 2007: 3 (as synonym of *C. kuntzeni*).

*Aphodius* (*Coelotrachelus*) *michiliensis* Deloya, 1991: 200; Skelley et al. 2007: 3 (as synonym of *C. kuntzeni*).

**Type locality.** Sierra de Durango [Durango, Mexico].

**Type repository.** Naturhistoriska Riksmuseet, Stockholm (holotype examined).

**Redescription.** Length 7.0-8.5 mm, elongate, strongly shiny, moderately convex, glabrous. Black; head and pronotum shadily piceous-reddish; antennae brown-reddish with blackish club; legs piceous, tarsi paler. Head transverse, arcuately narrowed anteriorly; epistome barely gibbous, finely regularly punctured; clypeus feebly sinuate at middle, obtusely denticulate and elongately sparsely ciliate at sides; genae obtusely rounded, rather densely and elongately bristled, protruding more strongly than eyes; frontal suture faintly impressed, not at all tuberculate. Pronotum strongly transverse, rather widely flattened on sides, faintly and finely punctured on disc, with large superficial punctures irregularly scattered laterally; sides thickly bordered, rounded, feebly depressed, S-shaped before hind angles and strongly narrowed to level of fourth elytral stria; hind angles distinctly obtusely dentiform; base distinctly bisinuate, thinly bordered. Scutellum elongate, feebly impressed basally, nearly smooth. Elytra oval-elongate; shoulder not at all denticulate, elongately bristled; striae fine, indistinctly punctured, faintly crenulate; intervals flat, apically slightly convex, faintly punctured. First segment of hind tarsi nearly two times longer than upper spur and nearly as long as following three segments combined. Male fore tibiae stout, spur hooked apically; pronotum less convex and more transverse; aedeagus Fig. 13-14. Female fore tibiae relatively stout and short, spur regularly acuminate apically; pronotum more convex and less transverse.

**Material examined.** MEXICO, Durango: Reserva La Michilia, 03.VI.1979, leg. M. Zunino, nido de tuza (1 ex., DCGC); México: Amecameca, 16.IX.1964, leg. G. Halffter (2 exx., DCGC); 2 Km S [San Nicolas] Coatepec, 19°7.5'N-99°25.5'W, m 2730, 16.II.2001, leg. D. J. Hafner, M. S. Hafner & J. E. Light, sifted from *Cratogeomys merriami* nest material (1 ex., LSAM).

**Distribution.** Mexico (Durango, México).

**Bionomics.** Sometimes found in the main tunnel just below the active push-ups of *Thomomys* Wied-Neuwied (Rodentia: Geomyidae) and not in the fecal chambers, or in the dung into the nest of the Southern pocket gopher *Thomomys umbrinus* (Richardson) (Deloya 1991: 206). They have also been collected in the nest of the pocket gopher *Cratogeomys merriami*. The specimens examined were collected in November, February and June.

***Coelotrachelus rudis* (LeConte, 1878)**

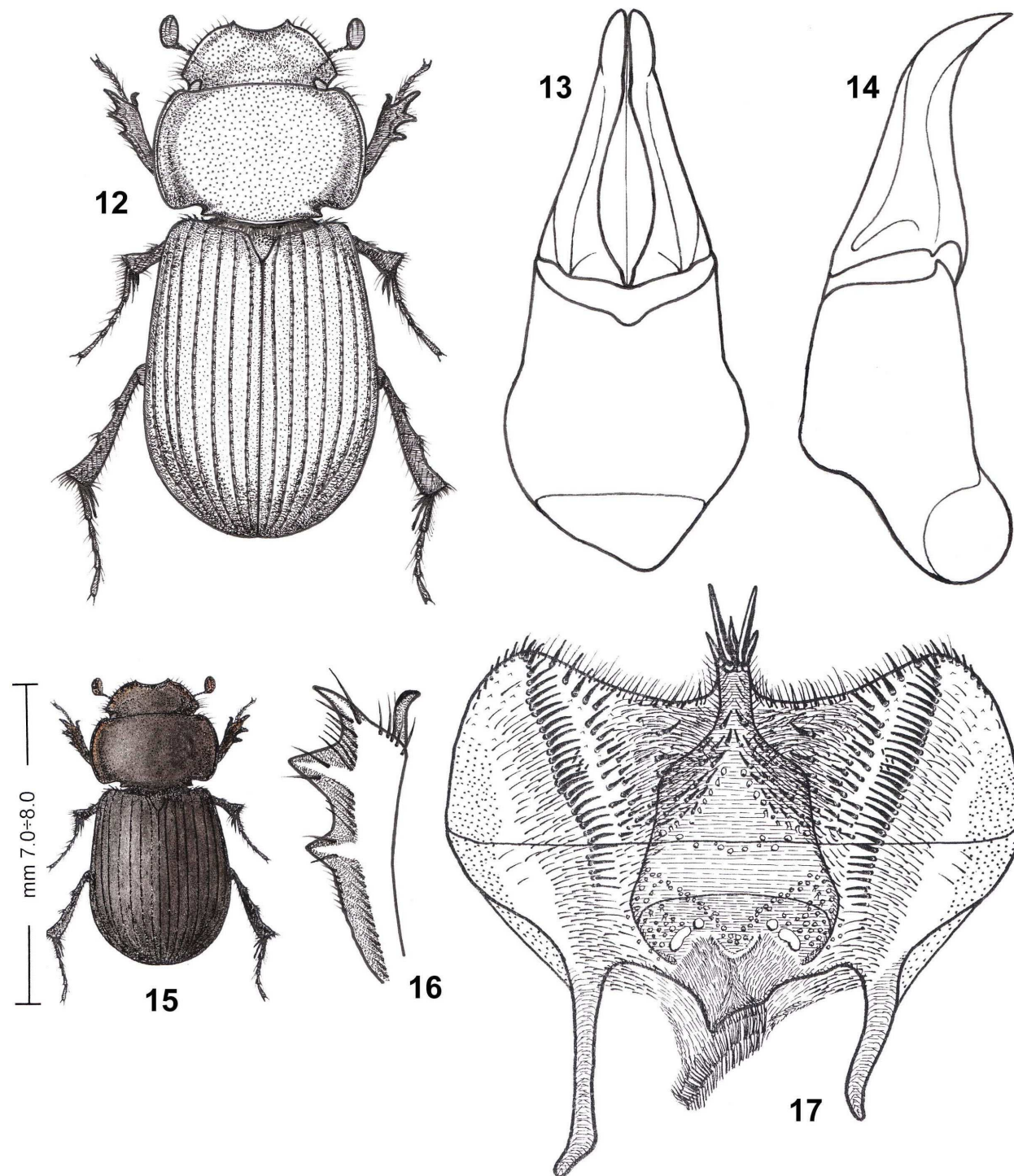
(Fig. 18-22)

*Aphodius rudis* LeConte, 1878: 458.

*Aphodius* (*Platyderus*) *rudis*; Schmidt, 1913: 123.

*Aphodius* (*Platyderides*) *rudis*; Schmidt 1922: 49; Dellacasa 1988: 191.





**Figures 12-17.** *Coelotrachelus kuntzeni* (Schmidt, 1913), holotype. **12)** Habitus (morphological details). **13-14)** Aedeagus (dorsal and lateral view). **15)** Habitus. **16)** Left fore tibia of male (dorsal view). **17)** Epipharynx.

*Aphodius feneyesi* Van Dyke, 1947: 159; Gordon and Skelley 2007: 481 (as synonym of *C. rudis*); Skelley et al. 2007: 3.

*Coelotrachelus rudis*: Gordon and Skelley 2007: 481 (new combination); Skelley et al. 2007: 3.

**Type locality.** Colorado [U.S.A.].

**Type repository.** Museum of Comparative Zoology (Cambridge, MA, USA) (type not examined)

**Redescription.** Length 6.0-7.5 mm, elongate, moderately convex, shiny, glabrous. Chestnut-brown, pronotal disc somewhat darker; antennal club pale testaceous. Head with epistome slightly convex on disc, very finely subregularly punctured throughout; clypeus broadly and feebly sinuate at middle, denticulate at sides (small denticles not upturned), faintly bordered, border laterally rather elongately sparsely ciliate; genae subacute, sparsely elongately ciliate, protruding more strongly than eyes; frontal suture short only laterally impressed; front relatively more distinctly punctured. Pronotum broadly transverse, feebly convex, dually punctured, large punctures, seven to eight times larger than small, rather densely arranged laterally, small punctures extremely fine and regularly sparse throughout; sides widely explanate, thickly bordered, border glabrous, S-shaped and distinctly crenulate before subacute hind angles placed at level of fifth elytral stria; base slightly bisinuate, not bordered. Scutellum with few fine basal punctures. Elytra oval, moderately convex, subdenticulate at shoulder; striae fine, superficially punctured, not crenulate at all; intervals nearly flat, minutely sparsely punctate. Hind tibial upper spur as long as first tarsal segment; latter as long as following three segments combined. Male fore tibial spur relatively short, blunt apically, abruptly bent downward; larger punctures of pronotum less widely spread; aedeagus Fig. 19-20. Female fore tibial spur relatively slender and regularly acuminate toward apex, not so abruptly bent downward; larger punctures of pronotum relatively more widely spread.

**Material examined.** **MEXICO, Chihuahua:** Canon Prieto, nr. Primavera, 6500-6800', 02.VII.1947, leg. Cazier, D. Rockefeller Exp. (3 exx., AMNH); Catarinas, 5800', 25.VI.1947, leg. Michener, D. Rockefeller Exp. (3 exx., AMNH); 44 mi S Hidalgo de Parral, 10.VII.1954, leg. J. W. Mac Swain (1 ex., DCGC); 8 mi W Matachic, 6400', 08.VII.1947, leg. Spieth, D. Rockefeller Exp. (2 exx., AMNH); Santa Barbara, 6300', 18.VII.1947, leg. Spieth, D. Rockefeller Exp. (2 exx., USNM); Yaguirachi, 8500', 30 mi W Chihuahua, 22.VI.1957 (1 ex., USNM); **USA, Arizona:** Madera Can., Pima Co., 15.VII.1981, leg. C. Lenczy (3 exx., DCGC); Prescott, 16.VIII.1951, leg. G. H. Nelson (1 ex., DCGC); Rio Rico, Sta. Cruz Co., VII.1982, leg. C. Lenczy (3 exx., DCGC); Williams, 09.VIII.1938, leg. D. J. & J. N. Knull (1 ex., DCGC).

**Distribution.** U.S.A. (southern Colorado, south in the mountain ranges of southern Arizona (Flagstaff) and northern and western New Mexico (Luna)), Mexico (Chihuahua).

**Bionomics.** Most specimens examined were collected between April and September; a rodent burrow associate, collected from burrows of the prairie dog *Cynomys gunnisoni zuniensis* Hollister (Gordon personal observation). It has been collected and reared from burrows of pocket gophers, *Thomomys* spp. (Gordon and Skelley 2007). Other genera of rodents may also serve as hosts. *Coelotrachelus rudis* is attracted to light.

***Coelotrachelus symbius* (Gordon and Howden, 1973)**  
(Fig. 23-27)

*Aphodius symbius* Gordon and Howden, 1973: 438.

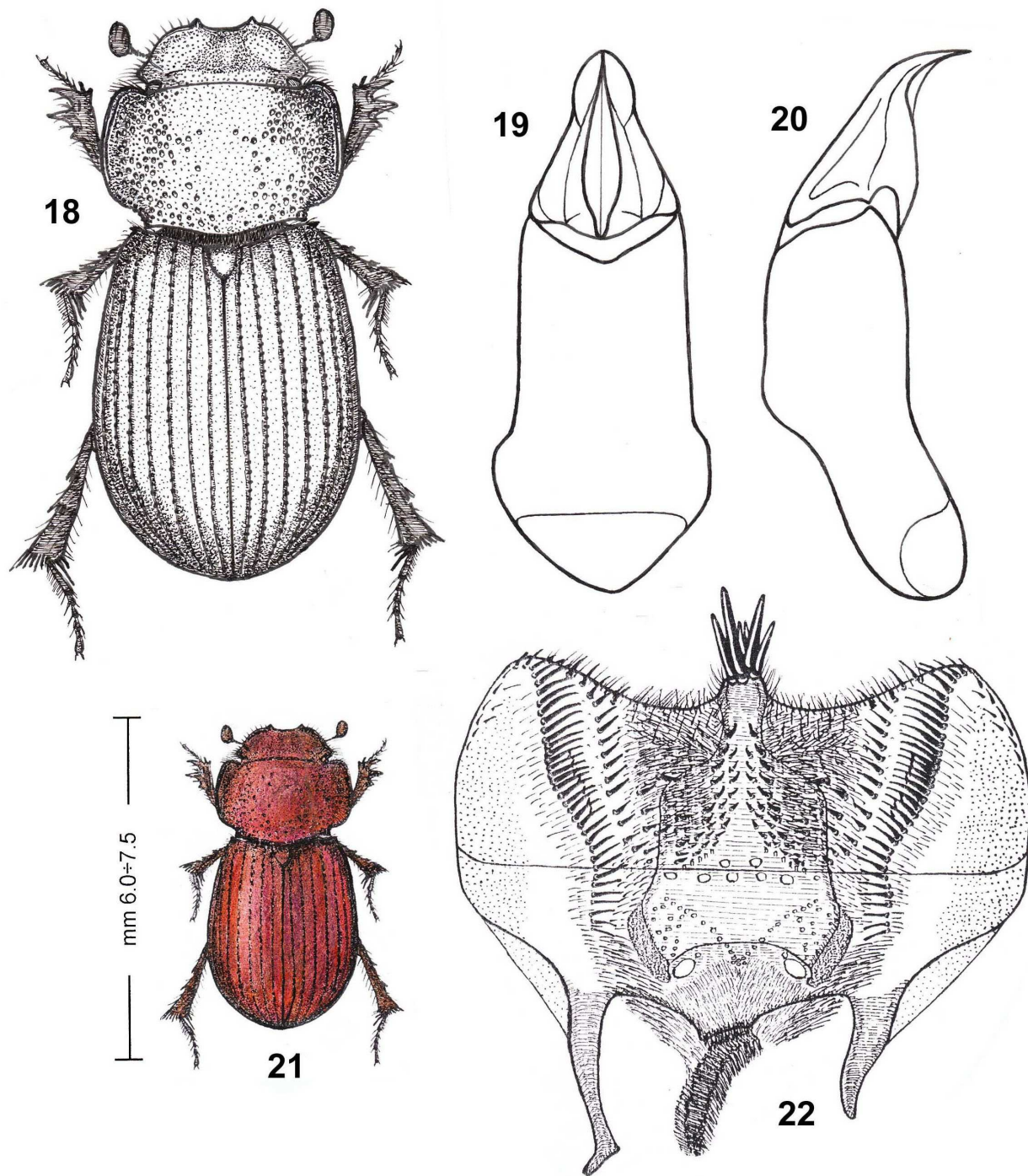
*Aphodius* (*Coelotrachelus*) *symbius*; Dellacasa 1988: 237.

*Coelotrachelus symbius*; Skelley et al. 2007: 3 (new combination).

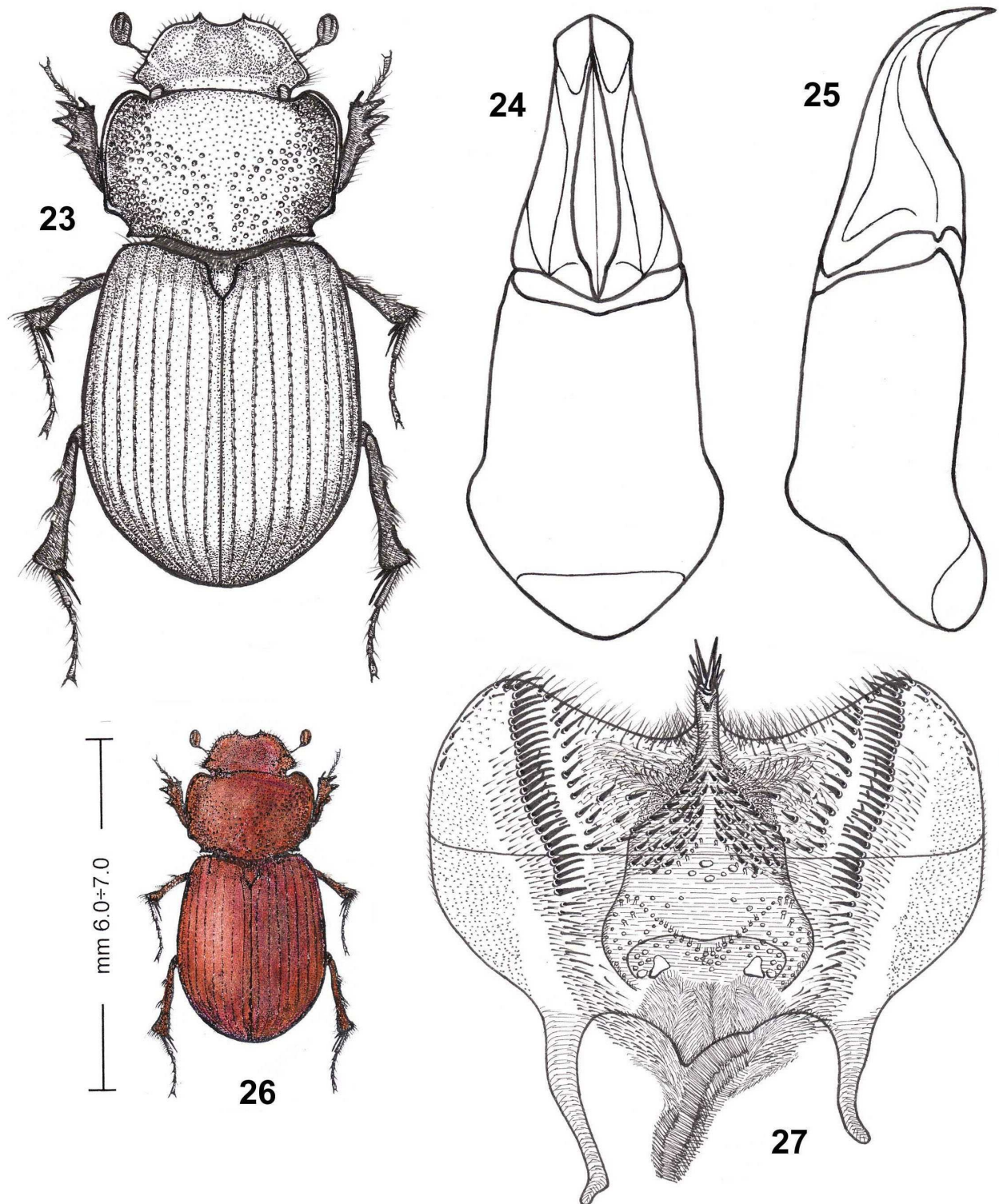
**Type locality.** Navajos, 20 miles E EI Salto, Durango, Mexico.

**Type repository.** Canadian National Collection. Ottawa (paratype male examined).





**Figures 18-22.** *Coelotrachelus rudis* (LeConte, 1878). 18) Habitus (morphological details). 19-20) Aedeagus (dorsal and lateral view). 21) Habitus. 22) Epipharynx.



**Figures 23-27.** *Coelotrachelus symbius* (Gordon and Howden, 1973). **23)** Habitus (morphological details). **24-25)** Aedeagus (dorsal and lateral view). **26)** Habitus. **27)** Epipharynx.



**Redescription.** Length 6.0-7.0 mm, oval-elongate, moderately convex, shiny, glabrous. Dark reddish to light brown; legs brown reddish; antennal club testaceous. Head with epistome feebly gibbous on disc, abruptly bent downward anteriorly, very finely and regularly punctured, punctation distally near obsolete; clypeus broadly sinuate at middle, with a small feebly upturned tooth at each side, not bordered, elongately ciliate; genae 90°, elongately ciliate, protruding more strongly than eyes; frontal suture short, impressed laterally only; front relatively more distinctly and densely punctured. Pronotum transverse, moderately convex, widely explanate on sides, dually punctured; large punctures, eight to nine times larger than small, irregularly sparse, lacking on disc and on anterior third, almost contiguous near posterior angles; small punctures nearly imperceptible and regularly scattered throughout; anterior angles rounded; lateral margins feebly arcuate, thickly bordered; hind angles abruptly truncate and inwardly sinuate, ending with a distinct angulation at level of sixth elytral stria; base feebly bisinuate, not bordered at all. Scutellum feebly convex, smooth. Elytra almost convex, feebly widened backward, with a very small humeral tooth; striae very fine, superficially punctured, faintly crenulate; intervals flat, almost imperceptibly punctured. Hind tibial upper spur nearly as long as first tarsal segment; latter as long as following three segments combined. Male fore tibial apical spur rather stout, inwardly feebly curved at apex, abruptly bent downward; aedeagus Fig. 24-25. Female fore tibial spur slender, elongate, slightly sinuate, regularly acuminate.

**Material examined.** **MEXICO, Durango:** Durango, 6200', 14.VIII.1947, leg. Cazier, D. Rockefeller Exp. (3 exx., AMNH); 20 mi E El Salto, 6000', 17-19.VI.1972, leg. H. F. Howden, in gopher burrow (1 ex., paratype, DCGC); 5 mi W Durango, 23.VI.1964, leg. H. F. Howden (1 ex., paratype, DCGC); **Sinaloa:** 38 mi NE Concordia, nr. Loberas [= La Lobera], 03.VIII.1982, black light (1 ex. DCGC).

**Distribution.** Mexico (Durango, Sinaloa).

**Bionomics.** Specimens were taken in a jar baited with human feces placed in the floor of a gopher burrow; others were dug from the main burrow system where there was indication of fresh gopher activity.

***Coelotrachelus venustus* (Schmidt, 1911)**  
(Fig. 28-32)

*Aphodius venustus* Schmidt, 1911: 28.

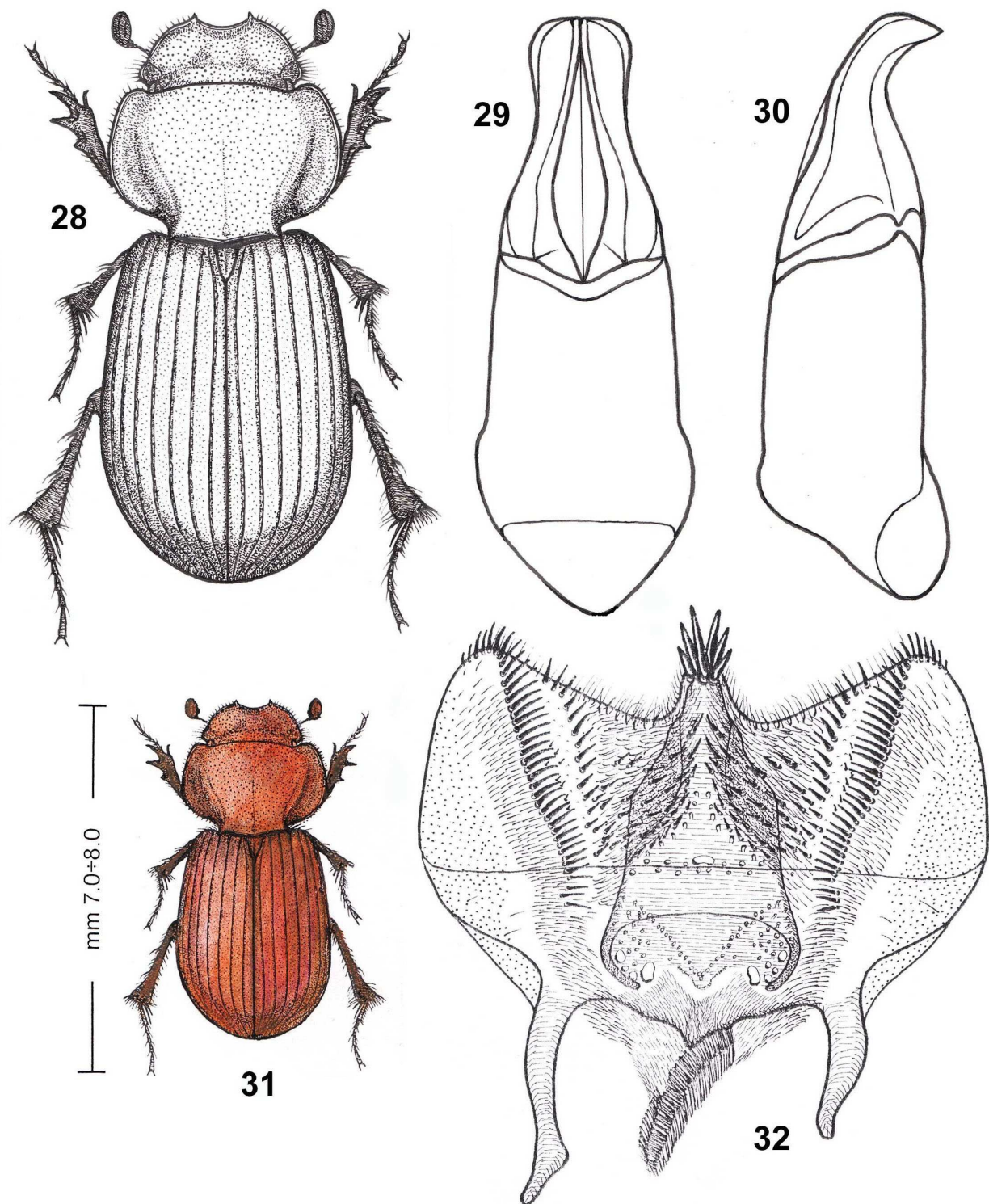
*Aphodius (Coelotrachelus) venustus*; Schmidt 1913: 140; Dellacasa 1988: 237.

*Coelotrachelus venustus*; Skelley et al. 2007: 3 (new combination).

**Type locality.** Mexico.

**Type repository.** Naturhistoriska Riksmuseet. Stockholm (holotype male examined).

**Redescription.** Length 8.0 mm; elongate, moderately convex, strongly shiny, glabrous. Brown-reddish; antennal club pale testaceous. Head wide, epistome feebly convex on disc and very finely regularly punctured throughout; clypeus broadly and feebly sinuate at middle, acutely denticulate at sides, thinly bordered, border laterally elongately ciliate; genae obtusely rounded, elongately sparsely ciliate, protruding more than eyes; frontal suture nearly faint; front relatively more sparsely punctured. Pronotum broadly transverse, with extremely fine punctures regularly scattered throughout, punctation somewhat confuse toward hind angles; sides moderately flattened, very thickly bordered, border near imperceptibly bristled, S-shaped before hind angles; latter acutely prominent and situated half way between the base of the fifth and sixth striae; base distinctly bisinuate, thinly bordered. Scutellum finely sparsely punctured on basal half. Elytra oval-elongate, convex, subdenticulate at shoulder; striae fine, rather superficially punctured, faintly crenulate; interstices nearly flat, minutely punctured. Hind tibial upper spur as long as first



**Figures 28-32.** *Coelotrachelus venustus* (Schmidt, 1911), holotype. **28)** Habitus (morphological details). **29-30)** Aedeagus (dorsal and lateral view). **31)** Habitus. **32)** Epipharynx.

tarsal segment; latter as long as following three segments combined. Male fore tibial spur relatively stout, subcylindrical, bent abruptly downward; aedeagus Fig. 29-30. Female: unknown.

**Material examined.** Only the holotype was examined.

**Distribution.** Mexico.

**Bionomics.** Unknown.

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